## REMARKS

This amendment is responsive to the prematurely *Final* Office Action of October 30, 2008. Reconsideration and allowance of the claims 1-11 and 17-24 are requested.

### The *Finality* of the October 30, 2008 Office Action Was Premature

In Amendment B of June 25, 2008, independent claim 9 was not amended. Yet, in the October 30, 2008 Office Action, claim 9 was rejected on a new ground of rejection. Because claim 9 was not amended in Amendment B, it is submitted that the new ground of rejection was not necessitated by Applicant's Amendment B.

Withdrawal of the *Finality* of the October 28, 2008 Office Action and entry of the present Amendment is requested.

### The Office Action

Claims 1-11 and 17 stand rejected under 35 U.S.C. § 103 over Ogino (US 6,985,613) in view of Salem ("X-Ray Computed Tomography Methods..."), further yet in view of Lambrect (US 5,019,323).

Claim 10 was further rejected under 35 U.S.C. § 112, second paragraph.

The Examiner withdrew claims 12-16, alleging a constructive election.

### Withdrawal of Claims 12-16 Was Improper

The Office Action recites portions of claims 12 and 13, and then draws the conclusion that the limitations are directed to an independent invention, without explaining the basis for the decision.

Detecting pairs of annihilation quanta from a PET tracer in blood with TOF-PET detectors is an inherent characteristic of all PET imaging including time-of-flight PET imaging. A similar limitation is already found in previously examined claim 2.

Using the time-of-flight information is again an inherent characteristic of time-of-flight PET imaging. Previously presented claim 2 already calls for recording the time-of-flight information.

Generating temporarily dynamic PET images is found only in previously presented claim 13, from which no other claims depended. Accordingly, the generation of a temporarily dynamic PET image goes only to claim 13 and is not properly a basis for holding a constructive election with regard to claims 12 and 14-16. Moreover, the generation of 3D PET images was set forth in previously examined claim 5.

**The Examiner is Misinterpreting Ogino**

"Time-of-flight" has very different meanings when used in conjunction with magnetic resonance imaging and with PET imaging. The reference to "time-of-flight" (TOF) in column 11, line 52, of **Ogino** is unrelated to TOF-PET.

In magnetic resonance imaging, the time-of-flight refers to a blood flow into an imaged slice or region. By distinction, time-of-flight in PET imaging describes the travel times of the two emitted $\gamma$ rays from the annihilation event that are detected by a pair of PET detectors as a coincident event.

In magnetic resonance angiography, a magnetic resonance sequence is applied such that blood outside of an imaging slice (typically perpendicular to a blood vessel of interest) is saturated. Then, when an image of the slice is generated, any saturated blood which has flowed into the slice is brighter than the stationary tissue. This technique can be used to make bright blood images without using an MR contrast agent, can be used with or without a contrast agent to determine direction of blood flow, and can be used to estimate blood flow velocity. Thus, in TOF-MRA (or TOF-MRI), the time-of-flight refers to the flow of blood.

In PET imaging, the PET tracer emits radiation which substantially immediately causes an annihilation event. The annihilation event results in a pair of $\gamma$ rays travelling in 180° opposite directions (if the two $\gamma$ rays were not travelling 180° opposite, there would not be a conservation of energy) at substantially the speed of light. When a pair of $\gamma$ rays is detected sufficiently closely together, they are deemed to be coincident. A line can be drawn between the two detectors which detected the

pair of coincident events, sometimes called a line of response (LOR). This LOR defines the line along which the annihilation event occurred (analogous to a one data point projection). In conventional PET imaging, these lines of response are reconstructed to generate the three-dimensional PET image.

The speed of the detection equipment has not gotten so fast that TOF-PET is now practical. That is, by measuring the difference in the time at which the two coincident radiation events were received, one can estimate the position along the LOR at which the annihilation event occurred. This localized region along the LOR is used in TOF-PET reconstructions. Thus, in TOF-PET, the time-of-flight refers to the travel time of the $\gamma$ rays.

**Exhibit**

The Applicant is attaching, as an Exhibit (not as prior art) a description of time-of-flight MR angiography and a description of time-of-flight PET (TOF-PET). These Exhibits contain a relatively straightforward description of time-of-flight magnetic resonance angiography and time-of-flight PET and what various terms are understood to mean in the art. From these two Exhibits, it can be seen that TOF-MRI (TOF-MRA) and TOF-PET have very different connotations in the art. These Exhibits are being submitted to provide background information only.

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**The Claims Distinguish Patentably Over the References of Record**

**Ogino** discloses an image producing device, particularly an MRI. While Ogino discloses time-of-flight (TOF) MRI techniques at col. 11, line 52, such techniques are performed by the appropriate application of gradients and other pulses during a magnetic resonance imaging sequence. Ogino does not disclose a TOF-PET unit.

Not only does Ogino not disclose a TOF-PET unit, Ogino does not disclose a data processing unit coupled to an image producing device and to a TOF-PET unit, which data processing unit performs the functions described in **claim 1**.

**Salem** discloses an image producing device, namely an x-ray/CT device. Salem does not disclose a TOF-PET unit. Nor does Salem disclose a data processing unit coupled to the imaging device and to a TOF-PET unit which performs the functions recited in claim 1. Thus, Salem does not cure the defects of Ogino.

**Lambrect** discloses a method and apparatus for producing iodine 124 for use in a PET scanner. Lambrect inferentially alludes to a PET image producing device, but does not actually disclose one. Moreover, Lambrect does not disclose a TOF-PET unit. Lambrect suggests using the iodine 124 in a conventional PET scanner, but makes no reference to a time-of-flight PET scanner. Thus, Lambrect fails to cure the shortcomings of Ogino and Salem.

Accordingly, it is submitted that **claim 1 and claims 2-8, 11 and 17 dependent therefrom** distinguish patentably and unobviously over the references of record.

**Claim 9** is patentable for the reasons set forth in Amendment B. The newly cited Lambrect reference does not cure the shortcomings noted in Amendment B . Lambrect relates to a method and apparatus for **making** PET tracers, particularly iodine 124. Lambrect does not set forth an enabling disclosure of a PET imaging device. Moreover, the tracer material is described by Lambrect as being for conventional PET. Lambrect does not even allude to time-of-flight PET (TOF-PET).

Dependent **claims 10 and 20-24** focus the claims more specifically and distinguish over the references of record even more strongly.

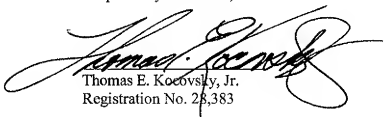
Accordingly, it is submitted that **claims 9, 10, and 20-24** distinguish patentably over the references of record.

## CONCLUSION

For the reasons set forth above, it is submitted that claims 1-11 and 17-24 distinguish patentably and unobviously over the references of record. An early allowance of all is requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case, the Examiner is requested to telephone Thomas Kocovsky at 216.363.9000.

Respectfully submitted,



Thomas E. Kocovsky, Jr.
Registration No. 28,383

FAY SHARPE LLP
The Halle Building, 5th Floor
1228 Euclid Avenue
Cleveland, OH 44115-1843
Telephone: (216) 363-9000 (main)
Telephone: (216) 363-9122 (direct)
Facsimile: (216) 363-9001
E-Mail: tkocovsky@faysharpe.com